REMARKS

This is in response to the Notice of Non-Compliant Amendment issued on October 20, 2006. Claim 7, has been modified to provide the status indicator "Currently Amended" rather than simply "Amended".

The balance of the Reply is a resubmission of the previous Reply and Amendment Pursuant to 37 C.F.R. §1.116.

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.116, and in light of the remarks which follow is respectfully requested.

As correctly noted on the Office Action Summary, claims 1-20 are pending in the application and are under consideration.

By the above amendments, claims 1, 4 and 7 have been revised as discussed below. These amendments do not include any new matter[1].

Turning to the Official Action, claims 4-7 stands objected to for the reasons set forth at page 2 of the Official Action. This objection has been obviated by the above amendments, where the minor informalities have been addressed[2]. Thus, withdrawal of this rejection is respectfully requested.

Claims 1, 3, 4-8, and 16 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Dunlop et al (U.S. Patent No. 6,030,514) in view of Leiphart (U.S. Patent No. 6,187,151 B1) and Levine et al (U.S. Patent No. 5,846,389). This rejection is traversed for the following reasons.

The present invention relates to a method of dry treating a sputtering target to achieve an enhanced finish on the surface that effectively reduces burn-in time of the target.

In particular, in one aspect of the invention, and as set forth in claim 1, a method of dry treating a target surface prior to using the target is provided. The method includes

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[1] Claim 1 has been revised to add a semicolon.

[2] While the Official Action points to claim 6, it appears that this is an inadvertent citation, as claim 6 does not contain the noted informality.

(a) preparing a target assembly and securing the target assembly in a vacuum chamber of a magnetron sputtering apparatus; (b) energizing the magnetic component of the magnetron sputtering apparatus with a power between about 0.2 kW and about 4 kW for a period of time between about 4 and about 30 minutes to produce a surface dry treatment of a sputtering ion plasma on an exposed surface of the target to effectively reduce inherently undesirable impurities on the surface; (c) removing the treated target assembly from the magnetron sputtering apparatus; and (d) preparing and packaging the target assembly for subsequent use in a sputtering deposition process.

Dunlop et al relates to a method of reducing sputtering conditioning time or so called burn-in and a target assembly thereof. Col. 1, lines 6-9. Based on the comments in the Official Action, it appears that this document has been applied as the primary reference for the disclosure of "pretreating a sputter target assembly and then preparing and packaging the assembly to be subsequently used in a sputtering process . . . ". See Official Action at page 3. Further, as stated at page 7 in response to Applicant's arguments, Dunlop allegedly discloses generically the cleaning of the target before packaging.

Leiphart has been relied on for the application of the process to the target of Dunlop et al. This position is improper for a number of reasons. First, Leiphart is directed to a method of in-situ cleaning and deposition on device structures in a high density plasma environment. Therefore, Leiphart discloses a procedure for cleaning high aspect ratio devices, and not the target. In this regard, Leiphart states:

> The present invention a [sic] method for in-situ plasma cleaning and sputter deposition in a single high density plasma chamber during the processing of a device structure. The present method is particularly useful for cleaning high aspect ratio device structures. (Emphasis added.) Col. 1, lines 53-56.
> The cleaning is preferably performed in-situ prior to deposition so as to minimize handling of the device structure. (Emphasis added.) Col. 2, lines 61-63.
> The gas ions clean the surface of the device structure 12 and cause ejection of by-products. Col. 3, lines 51-53.

Thus, clearly the process steps in Leiphart relate to the cleaning of the device and not the dry surface treatment of the target, as in the present invention.

Second, the process steps for cleaning the device/substrate in Leiphart does not do so in a magnetron sputtering apparatus, wherein the magnetic component is energized at a power between about 0.2 kW and about 4 kW for a period of time between about 4 and about 30 minutes to produce a surface dry treatment. In fact, Leiphart's apparatus is not even a magnetron sputter apparatus, nor does it disclose the process steps claimed. Therefore, one skilled in the art would not be able to carry out the process with the apparatus of Leiphart. Thus, one of ordinary skill in the art would not look to combine the disclosure of these documents where the disclosures are directed to such disparate subject matter.

As explained in Applicant's Specification, at pages 1-2, the preparation of the target reduces the lengthy burn-in time for targets delivered to customers (i.e., which are utilized in the deposition process). The pre-treatment reduces the impurities on the surface of the targets and provides for the formation of uniform film deposition during the deposition processes. This is not the case in Leiphart, for the aforementioned reasons. In addition, even assuming *arguendo*, albeit incorrectly, that the process of Leiphart could be applied to the target of Dunlop, one skilled in the art would have no reason to do so, as the target of Dunlop is already conditioned/treated.

Levine et al has been applied for the alleged disclosure of a rotating magnetron behind a target. See Official Action at page 4. However, Levine et al does not cure the above-described deficiencies in Leiphart. In particular, Leiphart does not disclose the dry treatment of the target surface prior to its use in a sputtering deposition process, much less the particular power set forth in step (b) of independent claim 1.

In this regard, Levine et al states:

> The rotating magnet assembly 28 provides a magnetic field adjacent the top surface 26 of the target facing the wafer to confine the ion "plasma" adjacent the target and thereby enhance the sputter coating process. Col. 3, lines 28-33.

Therefore, Levine et al discloses the use of the rotating magnet during the sputter coating process, and not as a means for conditioning the target surface prior to the sputtering deposition process. Moreover, even if combined in the manner suggested with

Dunlop et al, the skilled artisan would not arrive at the presently claimed invention. In this regard, it appears that the Examiner is picking isolated features of the various disclosure and combining them in an effort to arrive at the claimed invention. This is improper. If the proposed modification or combination of the prior art would change the principle of operation of the prior art being modified, then the teaching of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810 (CCPA 1959). This is the case here. In particular, Levine would change the principle of operation of the Leiphart apparatus, and the purpose for which the apparatus in Leiphart is used (i.e., cleaning the device/substrate). Thus, withdrawal of this rejection is in order and it is respectfully requested.

Claims 2, 10-15, 17, 19 and 20 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Dunlop et al in view of Leiphart and Levine et al and further in view of Ding et al (U.S. Patent Application No. 2003/0089601 A1). This rejection is traversed for the following reasons.

Dunlop et al, Leiphart and Levine et al have been discussed in detail above. Ding et al discloses an array of auxiliary magnets positioned along sidewalls of a magnetron sputter reactor on a side towards the wafer from the target. See Abstract. Ding et al has been applied for allegedly disclosing a sputtering apparatus including a rotating magnetron system "comprises less than 180 degrees". See Official Action at page 5.

Ding et al simply does not cure the deficiencies in Leiphart and Levine et al. Particularly, Ding et al does not disclose or suggest or disclose the dry treatment of the target surface prior to its use in a sputtering deposition process. Accordingly, withdrawal of this rejection is in order and it is respectfully requested.

Claims 9 and 18 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Dunlop et al in view of Leiphart and Levine et al and further in view of Arai et al (U.S. Patent No. 6,187,457). This rejection is traversed.

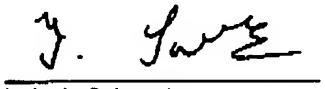
Leiphart and Levine et al have been discussed above. Arai et al relates to an electroluminescent light emitting device using an organic compound in which an electron injecting electrode for supplying electrons to a light emitting layer is provided thereon with

a sealing film. See Col. 1, lines 5-11. Arai et al has been applied for allegedly disclosing the use of FeNdB magnet. However, Aral et al does not even concern a magnetic component to be utilized in a sputtering system, much less cure the deficiencies in Leiphart and Levine et al. Thus, withdrawal of this rejection is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited.

If there are any questions concerning this paper, or the application in general, the Examiner is invited to telephone the undersigned at his or her earliest convenience.

Respectfully submitted,



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